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1. A variable compression piston assembly, comprising:

a plurality of pistons,

a transition arm coupled to each of the pistons, the transition arm including a drive member, and

a rotating member coupled to the drive member and mounted for pivoting movement to slide along an axis of the drive member, wherein movement of the rotating member relative to the drive member changes the compression ratio of the piston assembly.

2. The assembly of claim 1 wherein each of the pistons comprises a double ended piston.

3. The assembly of claim 2 wherein the transition arm is coupled to each of the double ended pistons at approximately a center of each double ended piston.

4. The assembly of claim 1 wherein the plurality of pistons comprises two pistons and the axis of rotation of the rotating member and axes of the two pistons lie on a common plane.

5. The assembly of claim 4 wherein each of the pistons comprises a double ended piston.

6. The assembly of claim 1 wherein the rotating member comprises a flywheel.

7. The assembly of claim 1 further comprising a counterweight mounted to the rotating member.

8. The assembly of claim 1 further comprising a main drive shaft, the rotating member being pivotably mounted to the main drive shaft.

9. The assembly of claim 8 wherein an axis of the main drive shaft is parallel to an axis of each of the pistons.

10. The assembly of claim 1 further comprising a movable pressure plate in contact with a peripheral region of the rotating member.

11. The assembly of claim 10 further comprising a roller interfacing the pressure plate and the rotating member.

12. The assembly of claim 10 further comprising a piston for biasing the rotating member into contact with the pressure plate.

13. The assembly of claim 1 wherein the drive member extends into an opening in the rotatable member adjacent to a periphery of the rotatable member.

14. The assembly of claim 13 wherein the drive arm extends into a pivot pin located in the rotatable member.

15. The assembly of claim 1 further including a universal joint connecting the transition arm to a support.

16. A method for varying the compression ratio of a piston assembly, comprising:

providing a plurality of pistons, a transition arm coupled to each of the pistons, and a rotating member coupled to a drive member of the transition arm and mounted for pivoting movement to slide along an axis of the drive member, and

pivoting the rotating member to change the compression ratio of the piston assembly.

17. A method of increasing the efficiency of a piston assembly, comprising:

providing a plurality of double ended pistons, a transition arm coupled to each of the double ended pistons at approximately a center of each of the double ended pistons, and a rotating member coupled to a drive member of the transition arm and mounted for pivoting movement to slide along an axis of the drive member, and

pivoting the rotating member to change the compression ratio of the double ended piston assembly.

18. A joint for positioning between first and second elements, the first and second elements being arranged for linear motion along a common axis, comprising:

an outer member configured for movement relative to the first and second elements along a first axis perpendicular to the common axis, the outer member defining an opening for receiving a drive arm, and

an inner member mounted within the outer member for rotation relative to the outer member about a second axis perpendicular to the first axis and the common axis, the inner member defining an opening for receiving the drive arm.

19. The joint of claim 18 wherein the outer member is configured for movement relative to the first and second elements along the second axis.

20. The joint of claim 18 wherein the outer member defines first and second parallel flat sides, each flat side defining a plane perpendicular to the common axis.

21. The joint of claim 20 further comprising first and second sliding members, the first sliding member for positioning between the first flat side and the first element, the second sliding member for positioning between the second flat side and the second element.

22. The joint of claim 20 wherein the first and second flat sides each comprise a polished surface.

23. The joint of claim 18 wherein the first and second elements each comprise a piston.

24. The joint of claim 18 wherein the first element comprises a piston and the second element comprises a guided rod.

25. The joint of claim 18 wherein the drive arm defines a longitudinal axis, the joint further comprising a mount for holding the drive arm axially stationary while permitting the drive arm to rotate about its longitudinal axis.

26. The joint of claim 25 wherein the mount comprises a cap screw.

27. The joint of claim 18 wherein the opening in the inner member comprises a channel defining a channel axis perpendicular to the second axis.

28. The joint of claim 18 wherein the opening in the outer member comprises a slot for accommodating movement of the drive arm when the inner member rotates relative to outer member.

29. The joint of claim 18 further comprising a thrust bearing for receiving an axial load transferred to the drive arm by the first and second elements.

30. The joint of claim 18 further comprising a sleeve bearing for receiving a normal load transferred to the drive arm by the first and second elements.

31. The joint of claim 18 further comprising a bearing located between the inner and outer members.

32. The joint of claim 18 further comprising a connector for mounting of the first and second elements thereto, the connector defining a cavity, the outer member and the inner member being positioned within the cavity.

33. A joint for positioning between first and second pistons of a double ended piston, the first and second pistons being arranged for linear motion along an axis of the double ended piston, the joint comprising:

an outer member having first and second parallel flat sides, each flat side defining a plane perpendicular to the double ended piston axis, the outer member being configured for movement relative to the first and second

pistons along first and second orthogonal axes, the first and second orthogonal axes being perpendicular to the double ended piston axis, the outer member defining an opening for receiving a drive arm, and

an inner member mounted within the outer member for rotation relative to the outer member about the first orthogonal axis, the inner member defining an opening for receiving the drive arm.

34. The joint of claim 33 wherein the outer member opening comprises a slot and the inner member opening comprises a channel having a channel axis perpendicular to the first orthogonal axis, the joint further comprising a mount for holding the drive arm axially stationary while permitting the drive arm to rotate about its longitudinal axis.

35. The joint of claim 33 further comprising a thrust bearing for receiving an axial load transferred to the drive arm by the first and second pistons, and a sleeve bearing for receiving a normal load transferred to the drive arm by the first and second pistons.

36. A piston assembly, comprising:

first and second elements configured for linear motion along a common axis, at least one of the first and second elements being a piston,

a joint positioned between the first and second elements, the joint including

an outer member configured for movement relative to the first and second elements along a first axis perpendicular to the common axis, the outer member defining a opening for receiving a drive pin, and

an inner member mounted within the outer member for rotation relative to the outer member about a second axis perpendicular to the first axis and the common axis, the inner member defining an opening for receiving the drive arm.

37. A method of reducing side load in a double ended member, the double ended member including first and second elements arranged for linear motion along an axis of the double ended member, the method comprising:

providing a joint located between the first and second elements, the joint including an outer member configured for movement relative to the first and second elements along a first axis perpendicular to the double ended member axis, and an inner member mounted within the outer member for rotation relative to the outer member about a second axis perpendicular to the first axis and the double ended member axis,

transferring load between the first and second elements and a drive arm mounted to the joint through two opposed surfaces of the outer member.

38. A method of reducing side load in a double ended piston assembly, the double ended piston assembly including first and second pistons arranged for linear motion along an axis of the double ended piston, the method comprising:

providing a joint located between the first and second pistons and configured to move relative to the first and second pistons along first and second orthogonal axes, the first and second orthogonal axes being perpendicular to the double ended piston axis, the joint defining two opposed flat surfaces, and

transferring load between the first and second pistons and a drive arm mounted to the joint through the two opposed flat surfaces.

39. An engine assembly, comprising:

a first piston assembly including at least two engine pistons coupled by a transition arm, and

a second piston assembly coupled to the first piston assembly, the second piston assembly including at least two engine pistons coupled by a transition arm, the first and second piston assemblies being mounted back-to-back and 180° out of phase.

40. The engine assembly of claim 39 further comprising cylinders for housing the engine pistons, pairs of engine pistons from the first and second piston assemblies sharing a common cylinder.

41. The engine assembly of claim 39 wherein each piston assembly further comprises compressor pistons mounted to move with respective engine pistons.

42. The engine assembly of claim 41 wherein each piston assembly comprises six pistons and two compressors.

43. The engine assembly of claim 39 further comprising a first rotating member mounted to the transition arm of the first piston assembly, and a second rotating member mounted to the transition arm of the second piston assembly and coupled to the first rotating member.

44. A method of cancelling vibration in an engine assembly, comprising:

providing a first piston assembly including at least two engine pistons coupled by a transition arm,

providing a second piston assembly including at least two engine pistons coupled by a transition arm, and

coupling the first and second piston assemblies in a back-to-back relationship and 180° out of phase.

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